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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/816,927	03/23/2001	Heinrich Brunner	GR 98 P 2651 P	6167

7590 07/18/2003

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EXAMINER	
ROSE, KIESHA L	

ART UNIT	PAPER NUMBER
2822	

DATE MAILED: 07/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/816,927	AUERBACH ET AL.	
	Examiner	Art Unit	
	Kiesha L. Rose	2822	

-- Th MAILING DATE of this communication app ars on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 May 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

This Office Action is in response to the request for reconsideration filed 12 May 2003.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 5-7,10-14, 16-17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishizawa et al. (U.S. Patent 5,175,598) in view of Stengl (U.S. Patent 5,113,237).

In regards to claims 1,5,10-12,16 and 20, Nishizawa discloses a semiconductor-switching device (Fig. 2) that contains a semiconductor body (4,5) of first conductivity type N with, edge regions, having a first and second surface which are opposite to each other, a first electrode (2') formed on the first surface, a second electrode (5') formed on the second surface, a semiconductor zone (2) of second conductivity type P, where a PN junction is formed between, and is in contact with the first electrode (2'), an injector disposed in a surface of the semiconductor body (4,5), semiconductor regions (3) of second conductivity type P with a second doping concentration provided in the semiconductor body (4,5) that are disposed at a respective distance from the

semiconductor zone (2) so that the semiconductor regions (3) surround the semiconductor zone (2) in a well shape.

In regards to claims 2,3,6,13,14 and 17, semiconductor regions (3) that are interrupted by channels formed in the semiconductor body (4,5) at a plurality of locations for increasing voltage where the channels are configured such that electric field spikes are avoided when a reverse voltage is applied between the first and second electrodes and an insulating zone (6) formed on the semiconductor body (4,5) that shields charge carriers.

Nishizawa discloses all of the limitations except for the semiconductor body having a doping concentration greater than 5×10^{13} charge carrier cm^{-3}. Whereas Stengl discloses a semiconductor device (Fig. 1) that contains a semiconductor body (1) with a doping concentration of 10^{18} cm^{-3} to properly form conductive regions. (Page 3, lines 55-57) Since Nishizawa and Stengl are both from the same field of endeavor, transistors, the purpose disclosed by Stengl would have been recognized in the pertinent art of Nishizawa. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the switching device of Nishizawa by incorporating the semiconductor body to have a doping concentration of 10^{18} cm^{-3} to properly form a conductive region in a semiconductor layer as taught by Stengl.

Claims 4 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishizawa et al. and Stengl as applied to claim 1 above, and further in view of Siergiej et al. (U.S. Patent 5,945,701).

Nishizawa and Stengl disclose all of the limitations except for the semiconductor body having a drift region. Whereas Siergiej discloses a static induction transistor (Fig. 12) that contains a semiconductor body, which contains a drift region (38) and channel regions (36) formed in drift region. The drift region is formed so that the charge carriers can flow from one region to the other. (Column 3, lines 27-31) Since Nishizawa, Stengl and Siergiej are both from the same field of endeavor, transistors, the purpose disclosed by Siergiej would have been recognized in the pertinent art of Nishizawa and Stengl. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the semiconductor devices of Nishizawa and Stengl by incorporating a drift region in the semiconductor body, which will allow for the charge carriers to flow from one region to the other as taught by Siergiej.

Claims 8, 9,18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishizawa et al. and Stengl as applied to claim 1 above, and further in view of Notley (U.S. Patent 5,324,971).

Claims 8 and 18, Nishizawa and Stengl disclose all of the limitations except for the semiconductor body to contain field plates and guard rings. Whereas Notley discloses a semiconductor device (Fig. 4) that contains a semiconductor body (2) that has field plates (20) formed on a surface of the semiconductor body. The field plates are formed on a major surface of the semiconductor body to cause electric fields to spread laterally outward across the active area to increase the breakdown voltage of the semiconductor device. (Abstract)

Claims 9 and 19, the semiconductor body also contains a guard ring (12) that surrounds the edge of the semiconductor body. The guard ring is formed to influence the voltage at the field plate areas. (Column 5, lines 15-24) Since Nishizawa and Stengl are both from the same field of endeavor, transistors, the purpose disclosed by Notley would have been recognized in the pertinent art of Nishizawa and Stengl. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the semiconductor devices of Nishizawa and Stengl by incorporating field plates and guard rings to increase the breakdown voltage of the semiconductor device as taught by Notley.

Response to Arguments

Applicant's arguments filed 12 May 2003 have been fully considered but they are not persuasive. Applicant's arguments referring to the Nishizawa et al. disclosing a channel region is erroneous as is disclosed in the prior art (Column 2, lines 51-67) that disclose that the switching device contains channel regions formed in the semiconductor body and surrounding semiconductor regions. In addition they are current channels are provide electrical connection to the semiconductor body. Therefore the rejection stands.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiesha L. Rose whose telephone number is 703-605-4212. The examiner can normally be reached on M-F 8:30-6:00 off 1st Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 703-308-4905. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

KLR
July 16, 2003

AMIR ZARABIAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800